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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,168	06/08/2006	Wei Chen	2936-0277PUS1	1860
2292 7590 12/10/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
DOERRLER, WILLIAM CHARLES				
ART UNIT		PAPER NUMBER		
3744				
NOTIFICATION DATE		DELIVERY MODE		
12/10/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

# Office Action Summary

**Application No.**

10/582,168

**Applicant(s)**

CHEN ET AL.

**Examiner**

William C. Doerrler

**Art Unit**

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 19-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 19-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SE-US)  
Paper No(s)/Mail Date 6-8-2006
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Specification***

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Stirling Refrigerator.

The disclosure is objected to because of the following informalities: The term "cold stocker" used throughout the written description and claims is confusing. It appears that all that is meant by the term is a refrigerator that is cooled using a Stirling cycle refrigeration unit. Nothing is stocked in the invention so the term is seen as misdescriptive. The term "refrigerator" appears to be the common term for what applicant is referring to, and should replace the term "cold stocker" throughout the specification and claims.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 19-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "cold stocker" is seen as misdescriptive. Nothing is stocked in the claims and there is no thermal storage. The term "refrigerator" is more descriptive of applicants' invention.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 19,20,22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (2004/0089012) in view of either Zhang et al (2005/0016184) or Barrash (2001/0039802).

Chen et al discloses applicants' basic inventive concept, a refrigerator 1 cooled by a Stirling cooler 8 with the warm heat exchanger 9 used to heat a condensate pan 15 through heat transfer line 16 and a second heat transfer line 17 used to heat a portion of

the housing to reduce the formation of dew. The use of the heat transfer passages are discussed in paragraph 60 and paragraph 68. These heat exchange passages (16 and 17) are seen as being in parallel configuration as there is no flow from one heat exchanger (in the drain pan or the dew reducing heat exchanger) to the other heat exchanger. Chen et al does not show a pump in the heat transfer fluid flows from the warm side heat exchanger (relying instead on thermosyphon effects or capillary attraction. Zhang et al (pump 23 seen in figure 7) and Barrash (pump 284 in figure 15 or pump 396 in figure 18) each show the use of pumps in heat transfer lines from the warm side heat exchanger of Stirling refrigerators to be known in the art to enable a higher rate of flow over a larger distance. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of either Zhang et al or Barrash to modify the Stirling cooler with hot end heat transfer circuits to evaporate condensate and to reduce the formation of dew by adding a pump to pump the heat transfer fluid to enable more heat transfer fluid to travel further distances or against gravity to enable different configurations and to increase the amount of heat transferred. The refrigerant in the warm-side heat exchanger is seen as being in two phase condition as it is in the process of vaporizing in the warm-end heat exchanger.

Claims 21,23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al in view of either Zhang et al or Barrash as applied to claims 19,20,22 and 24 above, and further in view of Arima et al (5,907,956).

Chen, as modified, discloses applicants' basic inventive concept, a Stirling cooler used to cool a refrigerator with the warm end of the Stirling cooler used to evaporate

condensate and to reduce the formation of dew on the cabinet, substantially as claimed with the exception of using valves to control the flow of heat transfer fluid in a parallel configuration. Arima et al show this feature to be old in the heat transfer art with valves 8 used to control the flow to individual heat exchangers from a common feed line. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Arima et al to modify the refrigeration system of Chen et al by using valves to control the flow to individual heat exchangers in a common parallel flow path to improve control over the amount of heat transferred in each heat exchanger.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Berchowitz et al shows a Stirling refrigerator with thermosyphons to transfer heat. Schulak et al shows a system using waste heat to reduce condensation on the surface of refrigerators. Behr shows a heat transfer system which uses valves in a parallel configuration between heat exchangers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Doerrler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

William C Doerler  
Primary Examiner  
Art Unit 3744

WCD

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